

CLAIMS

1. A vehicle occupant restraint device mounted on a back of an occupant's seat, for restraining a shoulder of an occupant thereby to protect a body of said occupant against a motor vehicle accident comprising:

 a receiving portion for receiving a shoulder side of said occupant softly;

 an arm portion; and

10 an instantaneous turning mechanism unit for moving said receiving portion, when an impact exceeding a predetermined level is applied to a vehicle, instantaneously from an initial position to a predetermined target position through said arm portion so that said receiving portion may take an arranged 15 state or position for receiving said shoulder side of said occupant.

2. A vehicle occupant restraint device mounted on a back of an occupant's seat, for restraining a shoulder of an occupant thereby to protect a body of said occupant against a motor vehicle accident comprising:

 a drive unit for driving in response to a collision sense signal;

25 a rotating shaft adapted to be triggered by driving of said drive unit for instantaneously moving from an initial

position to a predetermined target position;
an arm portion mounted on said rotating shaft; and
a receiving portion mounted on the other end of said arm
portion for receiving a shoulder side of said occupant softly.

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3. A vehicle occupant restraint device as set forth in claim
2: wherein said rotating shaft includes a flat shaft; a spline
shaft and a torsion spring for applying rotation of said flat
shaft and said spline shaft; a cam rotor for locking the
10 applying force of said torsion spring usually engages with said
flat shaft and said spline shaft; a gear lock for transmitting
the rotation of said drive unit engages with the cam rotor on
a side of said flat shaft; and a lock plate for locking said
shoulder receiving portion at a predetermined position engages
15 with the cam rotor on a side of said spline shaft.

4. A vehicle occupant restraint device as set forth in claim
3: wherein a lock state between said cam rotor and said gear
lock on the side of said flat shaft and/or a lock state between
20 said cam rotor and said lock plate on the side of said spline
shaft can be easily released.

5. A vehicle occupant restraint device as set forth in claim
2, 3 or 4: wherein said drive unit is made of a motor or an
25 electromagnetic actuator.

6. A vehicle occupant restraint device as set forth in claim
2, 3, 4 or 5: wherein said rotating shaft is disposed at or
near an upper side end portion of the back of said seat, and
5 said arm portion with curved shape is supported with said
rotating shaft having rotate capability.

7. A vehicle occupant restraint device as set forth in claim
2, 3, 4, 5 or 6: wherein said shoulder receiving portion
10 includes a support pad for receiving the shoulder side of said
occupant softly and a support plate for supporting said support
pad; and said support pad is made of an elastic member.

8. A vehicle occupant restraint device as set forth in claim
15 2, 3, 4, 5 or 6: wherein said shoulder receiving portion
includes a support pad for receiving the shoulder side of said
occupant softly and a support plate for supporting said support
pad; and said support pad includes a small airbag.

20 9. A vehicle occupant restraint device as set forth in claim
8 comprising an air pump or an inflator unit as a supply source
for supplying gas to said airbag.

10. A vehicle occupant restraint device as set forth in claim
25 9: wherein said rotating shaft and said arm portion are provided

with gas supply passages for supplying the gas from said air pump or said inflator unit to said airbag.

11. A vehicle occupant restraint device as set forth in claim
5 10: wherein said spline shaft and/or said flat shaft are provided with a notch as a portion of said gas supply passages in a circumference of said spline shaft and/or said flat shaft.

12. A vehicle occupant restraint device as set forth in claim
10 10: wherein said arm portion is provided with an L-shaped gas passage as a portion of said gas supply passages at a root portion of said arm portion.

13. A vehicle occupant restraint device as set forth in any
15 of claims 1 to 12: wherein said shoulder receiving portion and/or said rotating shaft are returned to the initial positions so that they can be reused after an action of said vehicle occupant restraint device.

20 14. A occupant restraint system having: a shoulder top restraint device for restraining a shoulder top of an occupant is mounted on one side of the back of an occupant's seat; and an occupant restraint device as set forth in any of claims 1 to 13 is mounted on the other side of said back.